Retrieving high resolution rainfall data for Ecuador using GOES-16 and IMERG data

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Accurate rainfall information in high spatio-temporal resolution is important for water resource management, particularly in water-scarce remote areas which are characterized by a coarse network of operational precipitation gauge stations. For such regions, satellite-based rainfall products potentially represent a source for reliable and area-wide data on rainfall. The poster presents a new satellite-based precipitation algorithm for semi-arid regions in Ecuador with the elevation range between 12 to 5700 a.s.l. The algorithm relies on the combination of precipitation information from the Integrated Multi-SatEllite Retrieval for the Global Precipitation Measurement (GPM) (IMERG) and infrared (IR) data from the Geostationary Operational Environmental Satellite 16 (GOES-16). The algorithm is developed to (i) classify the rainfall area and then (ii) to assign the rainfall rate. For the period between 19.04.2017 to 19.04.2018 the brightness temperature derived from GOES-16 IR channels and ancillary geo-information are trained with microwave only rainfall information of the half-hourly IMERG-V06 product using the machine learning algorithm random forest. The validation is done against independent microwave-only IMERG-V06 rainfall data not used for model training and available gauge stations. The validation results show overall very good accuracy of the new rainfall retrieval technique in this case study, mostly in comparison with the GPM IMERG IR-only rainfall product. The product offers the potential for high spatio-temporal (2 km, 15 min) rainfall resolution in near real-time for Ecuador.